Developing Children's Self-Efficacy and Skills: The Roles of Social Comparative Information and Goal Setting

By: Dale H. Schunk

Schunk, D. H. (1983). Developing children's self-efficacy and skills: The roles of social comparative information and goal setting. *Contemporary Educational Psychology*, *8*, 76-86.

Abstract:
How social comparative information and specific, proximal goals influence children's skillful performance and percepts of self-efficacy in the context of arithmetic competency development was explored. Low-achieving children in arithmetic received instruction in division and practice opportunities. One group was provided with social comparative information indicating the average number of problems solved by other children. A second group worked under conditions involving a goal of completing a given number of problems. A third group received both treatments, and a fourth group received neither treatment. Results yielded a significant main effect on perceived efficacy due to proximal goals. Children who received both goals and comparative information demonstrated the highest level of division skill. Results suggest exploring in greater detail how children weight and combine multiple sources of efficacy information.

Article:
According to Bandura's theory of *self-efficacy* (Bandura, 1977a, 1981), different treatments change behavior in part by strengthening perceived self-efficacy. Self-efficacy is concerned with judgments about how well one can organize and execute courses of action required in situations that may contain novel, unpredictable, and possibly stressful elements. Percepts of efficacy can affect choice of activities, effort expended, and perseverance in the face of difficulties. Efficacy information can be conveyed through enactive attainments, socially comparative vicarious measures, social persuasion, and inferences from physiological arousal.

In this conception, one important source of efficacy information involves social comparison of one's performance with the performances of others (Bandura, 1981). Although the social comparison process is employed by adults in forming self-evaluations (Festinger, 1954; Suls & Miller, 1977), less is known about how children utilize social comparative information. Recent developmental evidence suggests that the ability to utilize social comparative information effectively depends upon higher levels of cognitive development and experience in making comparative evaluations (Veroff, 1969). It is not until ages 5 to 6 that children begin to seek comparative information. In the early elementary school years, children show an increasing interest in comparative information (Ruble, Feldman, & Boggiano, 1976), and by the fourth grade children utilize such information to help form self-evaluations of competence (Ruble, Boggiano, Feldman, & Loebl, 1980).

There is also some evidence that comparative information influences behavioral and affective outcomes. Spear and Armstrong (1978) found that comparative information modified learning and motor performance among children in Grades 4 to 6 but was ineffective with kindergartners and first graders. Ruble, Parsons, and Ross (1976) demonstrated that comparative information influenced affective responses among 8-year-olds but not among 6-year-olds.

One purpose of the present study was to determine the effects of social comparative information given in the context of arithmetic competency development on children's skillful performance and percepts of self-efficacy. Following a pretest measuring division skill and perceived efficacy, low-achieving children in Grades 4 and 5 received instruction in division and opportunities to solve problems over two training sessions. Half of the sample received social comparative information indicating the average number of problems that other similar children solved during each training session. The rest of the children received no comparative information.

It was expected that social comparative information would enhance skillful performance and percepts of efficacy. Social comparative information constitutes a vicarious source of efficacy information (Bandura, 1981). Telling children how similar others perform at the task should promote a sense of efficaciousness for success. Children are likely to think that if other children could work a certain number of problems they can as well. Thus, the negative discrepancy between children's present performance level and the comparative level should motivate them and promote a sustained effort toward improvement (Masters, 1971). Children's initial sense of efficacy should be subsequently validated as they observe their actual progress in solving problems during training. In turn, heightened percepts of efficacy help sustain task involvement and lead to greater skill development.

These considerations bear some similarity to the literature concerning the effects of goal-setting procedures on performance and perceived efficacy. Goal setting represents a form of self-motivation in which persons compare present performances with internal standards. The anticipated satisfaction of attaining a goal leads to sustained involvement until performances match or exceed standards (Bandura, 1977b).

It is certain properties of goals, however, and not the goals themselves, that result in heightened motivation (Latham & Yukl, 1975; Locke, 1968). Important goal properties are specificity, difficulty level, and proximity. Goals that incorporate specific standards of performance are more likely to activate self-motivation and lead to higher performance than are vague goals ("Do your best") or no goals (Locke, 1968; Locke, Shaw, Saari, & Latham, 1981). Assuming that individuals have sufficient ability to accomplish the goal, there is much evidence demonstrating a positive and linear relationship between goal difficulty level and task performance (Locke *et al.*, 1981).

A third important goal property is proximity (Bandura, 1977b; Schunk & Gaa, 1981). Goals that are close at hand and that can be achieved rapidly result in greater motivation directed toward attainment and a higher level of performance than goals that project into the future (Bandura & Simon, 1977). Because distant goals are subject to many influences occurring more immediately, persons often forego or delay action on them (Bandura, 1977b).

Proximal goals can also enhance percepts of efficacy (Bandura & Schunk, 1981). It is easy to gauge progress against an immediate goal, and knowledge that one is making progress facilitates development of perceived efficacy. This should be especially important for young children whose cognitive limitations may preclude meaningful representation of distant outcomes in thought. Bandura and Schunk (1981) found that children who pursued proximal goals during a subtraction competency development program demonstrated higher arithmetic skills and percepts of efficacy compared with children provided with distant goals or no explicit goals.

A second purpose of the present study was to determine the effects of specific, proximal goals on children's division performance and percepts of efficacy. An adult proctor suggested to half of the children in each social comparison condition a goal of completing a certain number of problems during each training session. The number of problems suggested was identical to that indicated by the comparative information. Suggesting goals to children was also expected to enhance their task motivation and lead to higher levels of skillful performance and perceived efficacy.

There was no clear theoretical rationale for postulating differential effectiveness of either comparative information or goals on children's level of division performance and perceived efficacy. Thus, it was hypothesized that children receiving only comparative information and those receiving only goals would not differ from one another in their achievement outcomes but that each group would outperform children receiving neither treatment. Children who received both comparative information and goals were also expected to outperform those receiving neither; however, no hypothesis was advanced to the effect that the combined treatment would be more effective than either treatment alone. According to Bandura (1981), little is known about how children weight and combine efficacy information from multiple sources.

METHOD

Subjects

The sample consisted of 40 children in Grades 4 and 5 drawn from three elementary schools. Subjects ranged in age from 9 years, 8 months to 12 years, 4 months (M = 10.8 years). The 22 males and 18 females represented different socioeconomic backgrounds but were predominantly middle class. Because this study focused on processes whereby skills could be developed when they were initially lacking, teachers were shown the division skill test and identified children who they felt could not solve correctly more than about 30% of the problems. These children were individually administered the pretest by one of three adult, female testers.

Pretest

Self-efficacy judgments. Children's percepts of self-efficacy for solving problems were measured following procedures developed earlier (Bandura & Schunk, 1981; Schunk, 1981, 1982). The efficacy scale ranged from 10 to 100 in 10-unit intervals from high uncertainty (10) through intermediate values (50-60) to complete certitude (100). Children initially received practice with the efficacy assessment by judging their certainty of being able to jump progressively longer distances ranging from a few inches to several yards. Through this practice, children learned the meaning of the scale's direction and numerical values.

Children were then shown 14 sample pairs of division problems for about 2 sec each, which allowed assessment of problem difficulty but not actual solutions. The two problems constituting each pair were similar in form and in operations required, and corresponded to one problem on the ensuing skill test although they were not identical. For each pair, children privately judged their certainty of being able to solve correctly the type of problem depicted by circling an efficacy value. Children were judging their capability to solve types of problems and not whether they could solve any particular problem. Efficacy scores were summed across all 14 judgments and averaged.

Division skill test. Children received the skill test immediately after the efficacy assessment. This test consisted of 14 division problems ranging from 1 to 3 digits in the divisor and 2 to 5 digits in the dividend. Half of these problems were similar in form and operations required to some of the problems children solved during the subsequent training sessions, whereas the remaining problems were more complex. For example, children had to "bring down" numbers only once or twice per problem during training, whereas some skill-test problems required bringing down 3 numbers. The measure of skill was the number of problems that children solved correctly.

The tester presented the problems one at a time and verbally instructed children to place the page on a completed stack when they were through solving it or chose not to work it any longer. Children were given no performance feedback. The tester also recorded the time children spent on each problem. These persistence scores were summed across problems and averaged.

Training Procedure

Children were randomly assigned within sex and grade to one of four treatment groups (n = 10) according to a 2 (Comparative Information) × 2 (Goals) factorial design. On two consecutive school days, all children received 45-min training sessions, during which they worked on two training packets. These sessions followed a similar format except that the first session covered problems with 1-digit divisors whereas the second session was devoted to 2-digit divisors. The first page in each packet contained a step-by-step worked example that included bringing down one number. The second page contained a practice problem. The next several pages contained 2 or 3 problems per page to solve. Sufficient problems were included so that children could not complete all of them during the session.

Children were brought individually to a large room by an adult proctor and were seated at sufficient distances from one another to preclude visual and auditory contact. The proctor reviewed the explanatory page by pointing to the operations while reading from a narrative. If children indicated a lack of understanding, the proctor reread the relevant narrative but did not supplement it. Children then worked the practice problem, after which the proctor gave the treatment instructions appropriate to each child's experimental assignment. The proctor stressed the importance of children working problems carefully, and departed to an out-of-sight location. Children solved problems alone during training and received no performance feedback. Children maintained a tally sheet and recorded a mark after completing each problem. Thus, a record of their progress was continuously available.

Treatment Conditions

Comparative information only. At the start of the first training session, the proc-tor explained that she had worked with many other children and that half finished at least 25 problems. The 50% completion rate was chosen to foster self-motivation by presenting the task as challenging but attainable. The proctor reiterated these instructions prior to the second session except that she indicated 16 problems. These numbers of problems were arrived at through pilot testing with a group of children comparable to the present sample, and represented the average number of problems they completed during 45-min periods when advised only to work productively.

Goals only. The proctor suggested at the start of the first session that these children might want to decide to work at least 25 problems during the period. The proctor then asked children if that sounded reasonable. At the beginning of the second session, the proctor suggested a goal of 16 problems, and asked if that appeared reasonable. No child expressed concern over the goals. The goal instructions were offered suggestively so that the actual goal decision was left to the children, which was expected to increase self-involvement and goal commitment (Bandura & Schunk, 1981).

Comparative information + goals (combined). These children were given both sets of treatment instructions. The proctor initially gave goal-setting instructions, followed by social comparative information.

Training control. These children received the training packets but neither set of treatment instructions. This group controlled for the effects of receiving training.

Post-test

The post-test was administered 1 or 2 days after the second training session. The instruments and procedures were similar to those of the pretest except that a parallel form of the skill test was employed to eliminate possible problem familiarity. The parallel form was developed in conjunction with previous research (Schunk, Note 1), in which the two forms were administered in counterbalanced order to a sample comparable to the present one and children's scores on the two forms were highly correlated, $r(13) = .86$, $p < .01$. For any given child, the same tester administered both the pre- and post-tests, had not served as the child's training proctor, and was blind to the child's experimental assignment. All tests were scored by an adult who was unaware of children's experimental assignments.

RESULTS

Pre- and post-test means and standard deviations by experimental condition are presented in Table 1. Preliminary analyses of variance revealed no significant differences due to tester, school, grade level, or sex of child on any pre- or post-test measure nor any significant interactions. The data were therefore pooled across these variables. There also were no significant differences between experimental conditions on any pretest measure. Separate 2 (Comparative Information) × 2 (Goals) analyses of covariance were performed on each post-test measure using the appropriate pretest measure as the covariate. Significant results were further analyzed using the Newman— Keuls multiple comparison test (Kirk, 1968).

The use of analysis of covariance necessitated demonstration of slope homogeneity across treatment groups (Kerlinger & Pedhazur, 1973). Tests of slope differences for each measure were made by comparing a linear model that allowed separate slopes for the four treatment groups against one that had only one slope parameter for estimating the pretest—post-test relationship pooled across the four treatments. These analyses found the assumption of homogeneity of slopes across treatments to be tenable.

TABLE 1
PRE- AND POST-TEST MEANS (AND STANDARD DEVIATIONS)

		Experimental condition			
Measure	Phase	Information Only	Goals Only	Information and Goals	Training Control
Skill[a]	Pretest	3.4 (1.9)	3.4 (2.2)	4.4 (2.2)	4.0 (1.9)
	Post-test	5.2 (2.3)	4.0 (2.3)	9.5 (2.2)	6.2 (3.4)
Persistence[b]	Pretest	43.1 (24.4)	40.8 (22.6)	64.8 (38.0)	58.0 (42.3)
	Post-test	65.5 (22.3)	81.2 (44.4)	68.3 (29.8)	94.1 (31.4)
Self-Efficacy[c]	Pretest	45.6 (9.7)	54.1 (19.0)	54.5 (21.0)	53.6 (18.9)
	Post-test	59.0 (14.1)	74.2 (16.0)	79.4 (19.4)	65.5 (22.4)
Training progress[d]	Total	37.4 (5.9)	36.2 (6.5)	44.0 (2.6)	33.9 (12.8)

Note. $N = 40$; $n = 10$.
[a] Number of correct solutions on 14 problems.
[b] Average number of seconds per problem.
[c] Average judgment per problem; range of scale, 10 (low)−100.
[d] Number of problems worked.

For the measure of division skill, analysis of covariance yielded a significant main effect for Comparative Information, $F(1,35) = 8.12, p < .01$, as well as a significant Comparative Information × Goals interaction, $F(1,35) = 11.87$, $p < .01$. Post hoc comparisons revealed that the combined condition exhibited significantly $(p < .01)$ higher division skill than the other conditions, which did not differ significantly.

Analysis of covariance yielded no significant main effects nor a significant interaction for the persistence measure. This measure apparently reflects factors not addressed in this study. One possibility is work-rate preference. Some children may prefer to work slowly, whereas others generally work more rapidly.

Analysis of self-efficacy judgments revealed a significant main effect for Goals, $F(1,35) = 4.67$, $p < .05$. Post hoc comparisons showed that children who received both goals and comparative information judged efficacy significantly $(p < .05)$ higher than children who received only comparative information and subjects in the training control group. Children who received only goals also judged efficacy significantly $(p < .05)$ higher than subjects who were given only comparative information.

To investigate whether experimental treatments differentially affected training progress, analysis of variance procedures were applied to the number of problems children worked during the training sessions. A significant main effect for Comparative Information was obtained, $F(1,36) = 4.55$, $p < .05$. Post hoc comparisons revealed that children in the combined condition worked significantly ($p < .05$) more problems than subjects in the Goals Only and Training Control groups. A similar pattern was obtained when ANOVA procedures were applied to the number of problems children solved correctly.

DISCUSSION

Results of the present study indicate that providing children with specific, proximal goals, along with social comparative information indicating that the goals represent average attainment by other similar children, constitutes an effective means of fostering skill development and perceived efficacy for solving problems. One explanation for these results is as follows: Although providing goals to children should have had motivational effects, the goals themselves conveyed nothing about how difficult they were to attain. The comparative information indicated that the goals represented average achievement by similar others; by implication, this information conveyed that the goals were attainable. The perception of attainability among these children may have produced high expectations of success. Persons are more apt to accept goals when they hold high, as opposed to low, expectations of attaining them (Mento, Cartledge, & Locke, 1980). A greater degree of goal acceptance leads to higher task performance (Locke *et al.,* 1981). As children observe their progress during training, they develop a heightened sense of efficacy for solving problems. In turn, a strong sense of efficacy helps foster task progress and skill development.

In contrast, providing children with only goals did not lead to the same level of task progress or skill development. In the absence of comparative information, these children were on their own to determine the difficulty of goal attainment. Given that they were low arithmetic achievers who had experienced difficulty with division in their regular classrooms, they may have believed that the goals were highly difficult to attain, despite their expressed lack of concern over the goals. In the absence of requisite ability, high-difficulty goals do not boost performance (Locke *et al.,* 1981).

Yet, these children developed percepts of efficacy as high as those of children who received both goals and comparative information. To the extent that children who received only goals perceived them as highly difficult, they may have been overly swayed by their modest training successes and therefore felt more efficacious than their skill levels warranted. It is even possible that these children mistakingly assumed that goal attainment was synonymous with task mastery. Thus, even training accomplishments that only approximated the goals would have inflated percepts of efficacy. This explanation is only suggestive, since the present study did not investigate how children actually perceived the goals. Assessing these self-perceptions would have required some questioning of children following training. Such questioning would have provided these children with an additional source of efficacy information not found in the no-goal conditions. Future research might examine how children process goal information and how self-perceptions affect self-motivation and perceived efficacy.

Children who received only comparative information demonstrated as high a level of training progress as children who were given both goals and comparative information, but a lower level of skillful performance and perceived efficacy on the post-test. The comparative information apparently exerted some of its hypothesized motivational effects during training. But a high level of training progress does not imply that children who received only comparative information adopted it as a personal goal. Compared with children who were given both goals and comparative information, those who received only comparative information may have been less committed to attaining the comparative performance level, which would have contributed to a lower sense of efficacy; therefore, even approximations to this level during training might not have strengthened their sense of efficacy to the same degree. A lower sense of efficacy on entering the post-test would be expected to manifest itself in a lower level of division performance (Bandura, 1981).

The present findings support the idea that judgments of self-efficacy are not mere reflections of past performance (Bandura, 1981). These results are consistent with previous research in the area of achievement behavior (Bandura & Schunk, 1981; Schunk, 1981, 1982). In the present study, children who received only goals demonstrated a lower level of training progress than did children who were given both goals and comparative information, but both groups judged perceived efficacy equally high on the post-test.

Such findings are not surprising, since judgments of personal capabilities derived from one's performance vary depending on the weight placed on personal and situational factors that affect how one performs (Bandura, 1981). In forming efficacy judgments, persons weight the relative contribution of ability and nonability factors, such as perceived task difficulty, effort expended, amount of external aid received, situational circumstances under which the performance occurs, and temporal pattern of successes and failures. Evaluative standards that performances are appraised against constitute an additional influence on efficacy appraisals.

One idea for future research might be to compare the effects of self-set goals with those of other-set goals on children's level of skillful performance and perceived efficacy. Sagotsky, Patterson, and Lepper (1978) suggest that the effectiveness of goal-setting procedures might be enhanced if children are first trained on how to set challenging but attainable goals. Further, persons who are low in need for achievement, and who therefore may hold low expectancies for success, may perform better when they participate in the goal-setting process than when goals are externally supplied (Locke *et al.*, 1981; Steers, 1975). Research shows that self-set goals foster school achievement over regular classroom instruction (Gaa, 1973, 1979). These considerations indicate that training low-achieving children to set realistic performance goals might prove highly effective in developing skills and percepts of efficacy.

Future research also should explore in detail how children weight and combine sources of efficacy information. Although research in this area is lacking, Bandura (1981) believes that the development of perceived efficacy is influenced by common judgmental processes. In one potentially useful approach (Diener & Dweck, 1978), children verbalized as they solved problems. These verbalizations were recorded and categorized, such as representing useful task strategies, attributions, self-instructions, and affective statements. This type of experimental paradigm could identify how children form achievement-related beliefs from multiple sources, such as goals and comparative information, and how these beliefs relate to efficacy development.

Note:
1. SCHUNK, D. H. *Verbal self-regulation as a facilitator of children's achievement and self-efficacy.* Manuscript submitted for publication, 1982.

REFERENCES

BANDURA, A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review,* 1977, 84, 191-215. (a)

BANDURA, A. *Social learning theory.* Englewood Cliffs, N.J.: Prentice—Hall, 1977. (b) BANDURA, A. Self-referent thought: A developmental analysis of self-efficacy. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures.* Cambridge: Cambridge Univ. Press, 1981.

BANDURA, A., & SCHUNK, D. H. Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology,* 1981, 41, 586-598.

BANDURA, A., & SIMON, K. M. The role of proximal intentions in self-regulation of refractory behavior. *Cognitive Therapy and Research,* 1977, 1, 177-193.

DIENER, C. I., & DWECK, C. S. An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *Journal of Personality and Social Psychology,* 1978, 36, 451-462.

FESTINGER, L. A theory of social comparison processes. *Human Relations,* 1954, 7, 117-140.

GAA, J. P. Effects of individual goal-setting conferences on achievement, attitudes, and goal-setting behavior. *Journal of Experimental Education,* 1973, 42, 22-28.

GAA, J. P. The effects of individual goal-setting conferences on academic achievement and modification of locus of control orientation. *Psychology in the Schools,* 1979, 16, 591-597.

KERLINGER, F. N., & PEDHAZUR, E. J. *Multiple regression in behavioral research.* New York: Holt, Rinehart & Winston, 1973.

KIRK, R. E. *Experimental design: Procedures for the behavioral sciences.* Belmont, Calif.: Brooks/Cole, 1968.

LATHAM, G. P., & YUKL, G. A. A review of research on the application of goal setting in organizations. *Academy of Management Journal,* 1975, 18, 824-845.

LOCKE, E. A. Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance,* 1968, 3, 157-189.

LOCKE, E. A., SHAW, K. N., SAARI, L. M., & LATHAM, G. P. Goal setting and task performance: 1969-1980. *Psychological Bulletin,* 1981, 90, 125-152.

MASTERS, J. C. Social comparison by young children. *Young Children,* 1971, 27, 37-60. MENTO, A. J., CARTLEDGE, N. D., & LOCKE, E. A. Maryland vs. Michigan vs. Minnesota: Another look at the relationship of expectancy and goal difficulty to task performance. *Organizational Behavior and Human Performance,* 1980, 25, 419-440.

RUBLE, D. N., BOGGIANO, A. K., FELDMAN, N. S., & LOEBL, J. H. Developmental analysis of the role of social comparison in self-evaluation. *Developmental Psychology,* 1980, 16, 105-115.

RUBLE, D. N., FELDMAN, N. S., & BOGGIANO, A. K. Social comparison between young children in achievement situations. *Developmental Psychology*, 1976, 12, 192-197.
RUBLE, D. N., PARSONS, J. E., & Ross, J. Self-evaluative responses of children in an achievement setting. *Child Development*, 1976, 47, 990-997.
SAGOTSKY, G., PATTERSON, C. J., & LEPPER, M. R. Training children's self-control: A field experiment in self-monitoring and goal-setting in the classroom. *Journal of Experimental Child Psychology*, 1978, 25, 242-253.
SCHUNK, D. H. Modeling and attributional effects on children's achievement: A self-efficacy analysis. *Journal of Educational Psychology*, 1981, 73, 93-105.
SCHUNK, D. H. Effects of effort attributional feedback on children's perceived self-efficacy and achievement. *Journal of Educational Psychology*, 1982, 74, 548-556.
SCHUNK, D. H., & GAA, J. P. Goal-setting influence on learning and self-evaluation. *Journal of Classroom Interaction*, 1981, 16(2), 38-44.
SPEAR, P. S., & ARMSTRONG, S. Effects of performance expectancies created by peer comparison as related to social reinforcement, task difficulty, and age of child. *Journal of Experimental Child Psychology*, 1978, 25, 254-266.
STEERS, R. M. Task—goal attributes, *n* achievement, and supervisory performance. *Organizational Behavior and Human Performance*, 1975, 13, 392-403.
&as, J. M., & MILLER, R. C. (Eds.) *Social comparison processes: Theoretical and empirical perspectives.* Washington, D.C.: Hemisphere, 1977.
VEROFF, J. Social comparison and the development of achievement motivation. In C. P. Smith (Ed.), *Achievement-related motives in children.* New York: Russell Sage Foundation, 1969.